REMARKS

Claim Rejection Over 35 U.S.C. § 102(b)

Claims 1, 2, 4, 5, 17 and 21 were rejected as being anticipated by Boylan et al. (5,926,384). Boylan et al. disclose a synchronous rectifier controller to eliminate reverse current flow in DC-DC converters in Figs. 3 and 9. Those converters include the loss free impedance (Lo in Fig. 3A, L1 in Figs. 3B, 3C, and 9), filter capacitor (C1 and C2 in Fig. 3B), transformer (310 in Fig. 3A), electronic devices (Q1-Q4 in Fig. 3A), rectifier (Q5 and Q6 in Fig. 3A), load connected to the output windings, output capacitors (Co in Fig. 3A, C3 in Figs. 3B, 3C, and C2 in Fig. 9) and load (RL in Fig. 3A).

Applicants respectfully point out that there are fundamental differences between the power supply disclosed by Boylan et al and the power supply claimed by applicants, including the function and implementation of some of the above-mentioned elements of the Boylan patent as compared to the corresponding elements of applicants' power supply, and also the principle of operation.

The loss free impedance in the Boylan patent is an output filter inductor of a DC-DC converter [see col. 3, lines 1 and 66]. The purpose of that element is to filter out the pulsation of the rectified AC voltage generated by the rest of the power converter. To accomplish the filtering the loss free impedance must be connected between the synchronous rectifiers and the load as shown in the relevant figures of the Boylan patent. On the other hand, the loss free impedance (renamed for clarity as <u>essentially inductive impedance</u> in the currently amended claims) of applicants' invention is connected between the AC power source and a controllable loss free electronic circuit that can losslessly source or sink AC current. Applicants' invention shows no output filter inductor.

The Boylan patent aims to prevent reverse current flow in the output filter inductor of the DC-DC converter and the synchronous rectifier controller of that patent is not a power regulator. On the other hand, the control circuit of applicants' invention functions as a power regulator, which achieves regulation by intentionally reversing current in the loss free impedance. The Boylan patent is therefore fundamentally different from applicants' invention both in its purpose and in the implementation details.

In the Boylan patent the filter capacitors C1 and C2 are connected across the terminals of a DC power source (V_{IN} in Fig. 3B). There is no DC power source in applicants' invention, rather the source of power is AC; also there is no filter capacitor connected across the AC power source.

The Boylan patent shows a transformer. The functions of that transformer are to galvanically isolate and scale the chopped DC voltage as needed. The isolation and scaling functions of the transformer are commonly used in most power supply circuits, including applicants' invention. In that invention, however, an additional, uncommon, function of the transformer is to implement the essentially inductive impedance necessary for the power regulation; this is achieved by constructing the transformer such that it has considerable leakage inductance. Furthermore, the transformer in applicants' invention is fed by the AC power source and not by a chopped DC voltage as in the Boylan patent.

The electronic devices Q1-Q4 in the Boylan patent and the electronic devices 148-151 in applicant' invention are configured in a superficially similar way but their functions and

operation are quite different. In the Boylan patent those devices act as choppers and generate an AC voltage for the transformer from the input DC voltage. The power flow in those devices is directed from the DC input source towards the output. In applicants' invention the electronic devices generate a phase-shifted square-wave voltage by chopping the DC voltage that appears on the output capacitor. That square-wave voltage is used for the combined regulation of the AC power appearing between terminals 165 and 166 in Fig. 2 and the DC power appearing between terminals 163 and 162 in Fig. 2. The power flow in the electronic devices 148-151 is fundamentally bidirectional.

The sole purpose of the rectifiers (Q5 and Q6 in Fig. 3A) of the Boylan patent is to convert the AC voltage of the output winding of the transformer 310 into a DC voltage. In applicants' invention the electronic devices 148-151 act as a square-wave generator for terminals 165 and 166, a DC rectifier for terminals 163 and 162, and as a power regulator.

Based on the above discussed fundamental differences, applicants state that their invention cannot be anticipated by the Boylan patent.

Comment on the Cited Jadus et al. Patent

The Jadus patent (4,331,887) is aimed at generating rotating magnetic field by driving current through an inductor. The Jadus patent does not claim an AC power source, and does not regulate the power supplied to a load, and is therefore distinctly different from applicants' invention.

Comment on the Cited Jochum et al. Patent

The Jochum patent (5,926,384) discusses a circuit that reduces the transient spikes that appear at the output of a DC-DC converter when the load current suddenly changes. The circuit comprises transistors Q1 and Q2, which act as dynamic regulators, sourcing current to or sinking current from the load as needed. The Jochum patent is different from applicants' invention in its main purpose (it is not a power regulator), in its elements (it does not have an AC power source or an essentially inductive impedance), and its implementation details.

Conclusion and Request

Applicants proved that the invention cannot be anticipated by the Boylan et al. patent (5,926,384), because that patent discusses a fundamentally different structure, and the elements in that patent have different functions. Thus the rejection of the claims 1, 2, 4, 5, 17 and 21 on the basis of that patent is overcome. Accordingly, Applicants submit that all claims of the amended application are now in full condition for allowance, which action Applicants respectfully solicit.

Very respectfully,

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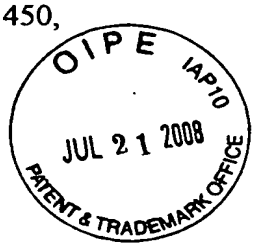

Date: 11 July 2008

Inventor's signature: _____